CBCS SCHEME

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15EE52

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
Microcontrollers

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Distinguish between :
(i) Microprocessor and Micro Controller
(ii) RISC and CISC Architecture **(08 Marks)**

b. Explain the different addressing modes of 8051. Give an example. **(08 Marks)**

OR

2 a. With neat diagram, explain the internal architecture of 8051. **(08 Marks)**

b. Explain following instructions mentioning their addressing mode and byte size.
(i) XCHD A, @R_0 (ii) MOVC A, @A + DPTR
(iii) SUBB A, #55h (iv) DA A **(08 Marks)**

Module-2

3 a. What are assembler directive? Explain any four of them with an example. **(06 Marks)**

b. Write an ALP to perform 16-bit × 8-bit multiplication. **(06 Marks)**

c. Explain the various bit-level instructions of 8051. **(04 Marks)**

OR

4 a. Explain the different types of conditional and unconditional Jump instructions of 8051. Specify the different ranges associated with Jump Instructions. **(08 Marks)**

b. Write an 8051 ALP to find average of marks scored by student in 6 subjects. Assume the marks are stored from location 40h and the average is to be stored at location 50h **(08 Marks)**

Module-3

5 a. What are the various data types supported by 8051C? Mention the range of representation in each case. **(04 Marks)**

b. Write an 8051C program to toggle all the bits of P_0 and P_1 continuously with 1MS delay. **(06 Marks)**

c. Write an 8051C program to get a byte of data from P_1 wait for ½ second, then send 97 to P_2. **(06 Marks)**

OR

6 a. Explain TMOD with necessary format. **(04 Marks)**

b. Write a program to generate a square wave of 75% duty cycle with ON time of 300ms on pin $P_{2.3}$. **(06 Marks)**

c. Write an 8051 C program to convert ASCII digits of '4' and '7' to packed BCD and display them on P_1. **(06 Marks)**

Module-4

7 a. Explain the function of RS 232C pins of DB-9 connector. **(06 Marks)**

b. Write a C-program of 8051 to transfer the letter 'C' serially at 9600 baud continuously use 8-bit data and 1 stop bit. **(06 Marks)**

c. With XTAL = 11.0592 MHz, find TH1 value needed to have the following baud rate.
(i) 9600 (ii) 2400 (iii) 1200 **(04 Marks)**

OR

8 a. What is an Interrupt? List the various interrupts of the 8051 with their corresponding vector address. **(06 Marks)**

b. Write a C program that continuously gets a single bit of data from $P_{1.7}$ and sends it to $P_{1.0}$, while simultaneously creating a square wave of 200 μs. Period on pin $P_{2.5}$. Use timer0 to create the square wave. Assume that XTAL = 11.0592 MHz. **(06 Marks)**

c. Explain asynchronous serial communication and data framing. **(04 Marks)**

Module-5

9 a. Interface 4×4 keyboard to 8051 and explain how scanning and identifying the key pressed is done. **(08 Marks)**

b. Draw and explain the block diagram to show how 8051 is connected to DAC 0808 at port P_1 using output buffer for DAC. **(08 Marks)**

OR

10 a. Explain with neat sketch of 8255 connection to stepper motor. **(08 Marks)**

b. Write a C program to send 55H and AAH to all ports of the 8255 continuously. Assume the base address of the 8255 is 4000H. **(08 Marks)**

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